IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A conductive carbonaceous-fiber sheet which has a thickness of from 0.05 to 1 mm, a weight per a unit area of from 60 to 250 g/m^2, a bending resistance (L) as determined by the 45° Cantilever method of 6 cm or higher, and an in-plane volume resistivity of 0.2 Ωcm or lower.

wherein the sheet comprises a binder or a product of carbonization of the binder in an amount of from 10 to 40% by weight and comprises carbonaceous fibers bonded to one another with the binder or its carbonization product through point contact,

wherein the binder or its carbonization product is present discontinuously as particles on the surface of the fibers.

Claim 2 (Original): The conductive carbonaceous-fiber sheet as claimed in claim 1, which has an air permeability as determined in accordance with JIS L 1096, method A (frazil method) of from 50 to 150 $cm^3/cm^2 \cdot sec$, the air permeability being a measure of the gas-diffusing properties of the sheet.

Claim 3 (Original): The conductive carbonaceous-fiber sheet as claimed in claim 1, which has a thickness of from 0.1 to 0.5 mm.

Claim 4 (Original): The conductive carbonaceous-fiber sheet as claimed in claim 1, which has a weight per a unit area of from 80 to 200 g/m^2.

Claim 5 (Original): The conductive carbonaceous-fiber sheet as claimed in claim 1, which has a bending resistance (L) as determined by the 45° Cantilever method of 8 cm or higher.

Claim 6 (Previously Presented): The conductive carbonaceous-fiber sheet as claimed in claim 1, which comprises carbonaceous fiber monofilaments having a diameter of from 6 to 50 μm.

Claim 7 (Original): The conductive carbonaceous-fiber sheet as claimed in claim 1, which has an in-plane volume resistivity of 0.07 Ωcm or lower.

Claim 8 (Original): The conductive carbonaceous-fiber sheet as claimed in claim 1, which comprises carbonaceous fibers fused to one another.

Claim 9 (Original): The conductive carbonaceous-fiber sheet as claimed in claim 1, which comprises carbonaceous fibers bonded to one another with a binder or a product of carbonization of the binder.

Claim 10 (Currently Amended): The conductive carbonaceous-fiber sheet as claimed in claim 1, which contains a binder or a product of carbonization of the binder in an amount of from 0.01 to 25% by weight and comprises carbonaceous fibers bonded to one another by ~~surface coating with~~ the binder present on the surface of the fibers or ~~its~~ a carbonization product thereof.

Claim 11 (Previously Presented): The conductive carbonaceous-fiber sheet as claimed in claim 10, which contains the binder or a carbonization product thereof in an amount of from 0.01 to 7% by weight.

Claim 12 (Canceled).

Claim 13 (Previously Presented): The conductive carbonaceous-fiber sheet as claimed in claim 1 , wherein the carbonaceous fibers are ones obtained by spraying or applying a dispersion of fine particles of a semicured thermosetting resin, optionally conducting drying, pressing or both drying and pressing, and then completely curing the resin.

Claim 14 (Previously Presented): The conductive carbonaceous-fiber sheet as claimed in claim 1, which is a woven fabric.

Claim 15 (Original): The conductive carbonaceous-fiber sheet as claimed in claim 1, which has a degree of fluffing of from the second to the fifth grade in terms of the index as determined through a fluff grade test.

Claims 16-29 (Canceled).

Claim 30 (Previously Presented): A solid polymer electrolyte fuel cell which employs the conductive carbonaceous-fiber sheet as claimed in claim 1 as a gas diffusion layer material.

Claim 31 (Canceled).

Claim 32 (Original): A motor vehicle having the solid polymer electrolyte fuel cell as claimed in claim 30 mounted therein.

Claim 33 (Canceled).

Claim 34 (Original): A cogeneration power system having the solid polymer electrolyte fuel cell as claimed in claim 30 installed therein.

Claim 35 (Canceled).

Claim 36 (Original): A solid polymer electrolyte fuel cell which employs the conductive carbonaceous-fiber sheet as claimed in claim 14 as a gas diffusion layer material.

Claim 37 (Previously Presented): A solid polymer electrolyte fuel cell which employs the conductive carbonaceous-fiber sheet as claimed in claim 15 as a gas diffusion layer material.

Claim 38 (Previously Presented): The conductive carbonaceous-fiber sheet as claimed in claim 1, wherein the carbonaceous fibers are oriented.

Claim 39 (Previously Presented): The conductive carbonaceous-fiber sheet as claimed in claim 1, wherein the carbonaceous fibers are axially oriented to one another.

Claim 40 (Previously Presented): The conductive carbonaceous-fiber sheet as claimed in claim 1, wherein the carbonaceous fibers are twisted yarns.

Claim 41 (Canceled).

Claim 42 (New): The conductive carbonaceous-fiber sheet as claimed in claim 1, wherein the point contact is present between two fibers.

Claim 43 (New): The conductive carbonaceous-fiber sheet as claimed in claim 1, wherein the point contact is between a particle of a thermosetting resin and at least two fibers.

Claim 44 (New): The conductive carbonaceous-fiber sheet as claimed in claim 1, wherein the binder is present in an amount of from 0.01 to 4% by weight based on the total weight of the conductive carbonaceous-fiber sheet.

Claim 45 (New): The conductive carbonaceous-fiber sheet as claimed in claim 1, wherein the binder is present in an amount of from 0.01 to 7% by weight based on the total weight of the conductive carbonaceous-fiber sheet.

Claim 46 (New): The conductive carbonaceous-fiber sheet as claimed in claim 1, wherein the point contact is 200 μm or smaller.

Claim 47 (New): The conductive carbonaceous-fiber sheet as claimed in claim 1, wherein the point contact is 50 μm or smaller.

BASIS FOR THE AMENDMENT

Claims 1-11, 13-15, 30, 32, 34, 36-40 and 42-47 are active in the present application. Claims 12, 16-29, 31, 33, 35 and 41 have been canceled. Claims 42-47 are new claims. Independent Claim 1 has been amended to require that the binder is present discontinuously as particles on the surface of the fibers. Support for the amendment is found in Figure 2 of the specification as originally filed. Support for new Claims 42 and 43 is found in Figure 2. Support for new Claims 46 and 47 is found on page 27, line 6 from the bottom. Support for new Claims 44 and 45 is found on page 27, lines 1-6. No new matter is believed to have been added by this amendment.

REQUEST FOR RECONSIDERATION

Applicants thank Examiner Vo for the helpful and courteous discussion of December 2, 2004. During the discussion, Applicants' U.S. representative presented arguments that a process of preparing the claimed sheet wherein the binder material is applied to the sheet in the form of a dispersion of droplets (e.g., particles) of the resin in a matrix provides a product that is structurally different from a product obtained by immersing a fiber sheet in a homogenous solution of resin.

Independent Claim 1 has been amended to require that the binder is present discontinuously as particles on the surface of the fibers.

The Office rejected the present claims in view of patents to Miwa (U.S. 4,851,304) and Koschany (U.S. 6,183,898). Applicants submit that the presently claimed conductive carbonaceous-fiber sheet is not obvious in view of the sheets and fiber-type materials of Miwa at least because none of the prior art references relied upon by the Office disclose a sheet wherein binders are present discontinuously on the surface of the fibers of the sheet.

The sheet of the claimed invention may be prepared by applying a dispersion of the binder onto the sheet. Applicants submit that those of ordinary skill in the art readily recognize that a dispersion is a suspension or mixture of one immiscible material within another. A dispersion of the binder of present independent Claim 1 is one wherein the binder is present as particles (e.g., droplets) suspended in a matrix. When the dispersion is applied to a fiber sheet the matrix of the dispersion may contact a large area of the surface of the fibers making up the sheet. The particles (e.g., droplets) of resin suspended in the dispersion touch only a small area of the fibers. When the matrix phase is removed (e.g., dried) the droplets (e.g., particles) of resin remain and are bonded discontinuously at various points to the fibers.

Because the binder is present in the form of particles (e.g., droplets) the binder only contacts the surface of the fibers at those points wherein a particle is in direct contact with the binder and does not contact the entire surface of the fiber.

In contrast, in the process of Miwa the step of impregnating the resin into the prior art carbon fiber mat is disclosed as follows:

> Impregnation of the resin into the carbon fiber mat may be practiced by dipping the carbon fiber mat into a resin solution dissolved in a solvent such as water, methanol, tetrahydrofuran, dioxane, N-methylpyrrolidone, etc., or spraying the above resin solution onto the carbon fiber mat. The resin concentration of the solution used is preferably controlled to about 5 to 50% by weight, in view of easiness of impregnation. Then, the solvent is removed by heating (see column 8, lines 39-47).

In Miwa the binder is contacted with the fibers of the fiber sheet by immersing the fiber sheet into a solution of the resin in a solvent. It is not disclosed in Miwa that a multiphase mixed composition such as a dispersion is used for this purpose.

In the examples the prior art carbon fiber mats are impregnated with solutions of a resin (see column 12, lines 32-37; and column 19, lines 36-40). Because the Miwa process requires contacting (e.g., submersing) the prior art fiber sheet with a solution of a resin, the method of Miwa will not lead to discontinuous point contact but instead may provide a uniform coating of the prior art resin over the surfaces of the fibers making up the sheet.

The structure of the presently claimed fiber sheet offers advantages because the binder is not present over the entire surface of the fibers making up the sheet. If the fibers of the sheet are covered with a resin, the mesh size of the fiber sheet will change and impair the ability of gas to flow through the prior art fiber sheet. The problem may be avoided by placing only particle of the resin discontinuously over the fiber surface.

The examples of the present specification demonstrate how different structures are obtained from a process wherein the binder is applied to the carbonaceous fiber sheet by

dipping the sheet in a solution of the resin in comparison to applying a dispersion of the resin onto the fiber sheet. Example 8 on page 40 of the specification describes the preparation of a conductive carbonaceous-fiber woven fabric made by technique (2) described in the specification on pages 27 and 28. A woven fabric is exposed to an aqueous dispersion of a semicured phenolic resin. The phenolic resin is present in the aqueous dispersion in an average particle diameter of 20 μm. The resulting woven fabric is shown in high magnification in Figure 2 of the drawings. Figure 2 shows that the binder does not cover the entire surface of the fiber but instead is present only at the point where the particle of the semicured thermosetting resin is present.

A comparison of Figures 1 and 2 of the present specification demonstrate the differences between the presently claimed fiber sheet and fiber sheets that do not have discontinuous point contact of a resin at only some parts of the surfaces of the fiber sheets.

Applicants submit that the conductive carbonaceous-fiber sheet of present independent Claim 1 is different from the carbonaceous carbon-fiber sheets of the prior art references because the binder/fiber interface is different in the claimed invention in comparison to the prior art. In the claimed invention contact between the binder and the surface of the fibers is only at a very small portion of the overall fiber surface area. In contrast, because Miwa applies the binder to the prior art fibers by dipping the fibers into a heterogeneous solution of the resin, the prior art fibers will be coated to a greater and more uniform degree in comparison with the claimed conductive fiber sheet.

Applicants submit the amendment to the claims places all now-pending claims in condition for allowance. Applicants respectfully request the withdrawal of the rejection and the allowance of all now-pending claims.

Respectfully submitted,

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